
Space Weather Forecast

Issued on Friday 21 March 2025 at 13:07 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Chance of isolated Moderate class flares. Chance of G1-G2/Minor-Moderate Storms throughout, due to coronal mass ejection arrivals, and faster solar winds.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with only Common class flares. There are currently 12 sunspots on the Earth facing disc, consisting of eight numbered regions and four unnumbered regions. Despite the large amount of sunspots, the vast majority are small and simple and have remained largely unchanged in recent hours. The largest, a spot in the northwest, has shown some recent development of its intermediate spots.

There was evidence of material ejected from the solar disc occurred around 20/1823 UTC, from the southeast quadrant, close to centre disc, but no associated CME (coronal mass ejection) was observed in available imagery. If a CME was emitted it could potentially have an Earth directed component.

Solar Wind / Geomagnetic Activity: Solar winds were between background and slightly elevated levels, seeing a sharp rise to around 440km/s following the CME arrival at 21/0141UTC, then slowly declining to current background levels around 380 km/s. The strength of the Magnetic Field was weak for much of the period, but became moderate from around 21/1000UTC. The north-south component, Bz, being weak, favouring negative until around 21/0500UTC after which point it favoured a positive direction. Geomagnetic activity was Quiet to unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Generally Low activity is expected, with a chance of isolated M-class flares.

Solar Wind / Geomagnetic Activity: Solar winds are expected to generally be at background levels, rising slightly with any weak/glancing CME (coronal mass ejection) arrivals, until a connection with a high speed stream associated with a coronal hole in the western hemisphere. This high speed stream connection is most likely to occur through later Day 2, or perhaps into Day 3 (22-23 Mar) with solar winds perhaps reaching elevated levels (500+ km/s).

Generally Quiet activity is expected initially, with a chance of G1-G2/Minor-Moderate storms throughout should any of the possible CMEs arrive, combined with the HSS from CH24.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at background levels, with a slight chance of enhancement from any larger flares.

Geomagnetic Storms

Geomagnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	20	50	50	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 (M Class)	No	30	30	30	30
Very Active	R3-R5 (X Class)	No	1	1	1	1

Solar Radiation Storms (High Energy Protons)

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = cm ⁻² sr ⁻¹ s ⁻¹)						